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### Revision of the Genus *Morganella* (Lycoperdaceae)

PATRICIO PONCE DE LEON  
ASSISTANT CURATOR, CRYPTOGAMIC HERBARIUM  
FIELD MUSEUM OF NATURAL HISTORY

*Morganella* Zeller, Mycologia 40: 650. 1948, emend. Kreisel & Dring, Feddes Rep. 74: 109. 1967. *Radiigera* Zeller subgenus *Endoplectydium* Singer, Wright & Horak, Darwiniana 12: 160. 1963.

Fructifications epigeous, 1–3 cm. in diameter, depressed-globose to turbinate; peridium double; exoperidium velutinous, furfuraceous, granular, tuberculose or spinulose, whitish, tan, flesh-colored, or deep red-brown to purplish-black; endoperidium papery above, thickened below, flaccid, smooth or reticulate, mouth irregular, apical; gleba pulverulent, without a true capillitium, paracapillitium abundant, glebal membranes abundant, pseudocolumella sometimes present, these elements all strongly cyanophilous; subgleba compact or chambered (sometimes almost indiscernible); spores globose to broadly ovoid, smooth, verruculose to spinose, 3.5–4.5  $\mu$  in diameter.

Species usually growing on decaying wood.

*Type species*.—*Morganella mexicana* Zeller, Mycologia 40: 650. 1948.

*Type locality*.—Mexico. Specimens: *Macbride*, Sonora, Guaymas (NY). The material deposited by Zeller in the Morgan Herbarium at the University of Iowa cannot be found. The material from Newfield, New Jersey, *Ellis 5013* (NY), cited as paratype by Zeller, has been identified by Kreisel (1967) as *Morganella velutina* (Berk. ex Mass.) Kreisel and Dring.

*Geographic distribution*.—*Morganella* is pantropical, with most of the species, *M. fuliginea*, *M. velutina*, *M. puiggarii*, and *M. stercoraria*, occurring in tropical America; *M. velutina* reaches the temperate zone in eastern North America, and *M. puiggarii* reaches it in South America; *M. fuliginea* covers a wide area in tropical America, and also occurs in West Africa; *M. stercoraria* occurs only

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in the West Indies; *M. afra* occurs in tropical Africa; *M. purpurascens* has a wide distribution in tropical Asia; *M. samoense* is known only from Samoa; *M. compacta* and *M. subincarnata* are the only two extra-tropical species—*M. compacta* occurring only in New Zealand and *M. subincarnata* in the temperate zone of North America.

It appears possible to me that the Caribbean region may have been the geographical center of development of *Morganella*, at least of the American species, and perhaps of all of them. *Morganella fuliginea* and *M. velutina* are especially abundant in Caribbean and circumcaribbean lands.

*Discussion.*—*Morganella* is easily distinguished from *Lycoperdon*, *Calvatia*, *Bovista*, and other members of the Lycoperdales, by its small size, habit of growing on wood, absence of capillitium, and the presence of abundant glebal membranes and paracapillitium. The peridium has two layers. The outer one is used to separate the species: it is velvety or velutinous in *M. velutina* and *M. puiggarii*; tuberculose in *M. fuliginea*, *M. purpurascens*, *M. subincarnata*, and *M. samoense* (the tubercles composed of pluricellular hyphae); granulose in *M. afra*; with large spines in *M. compacta*. The lignicolous habit is characteristic of all species of *Morganella* except *M. stercoraria*, which lives on cow dung. In the remaining Lycoperdales, only *Lycoperdon pyriforme* lives on decaying wood and *Lycoperdon (Bovista) acuminata* in the bark of living trees; both of these species have abundant capillitium in the gleba.

Although Zeller's decision to place *Morganella* in the Lycoperdaceae instead of the Mesophelliaceae was, according to his own statement, "for convenience" until more was known as to the membranes in the gleba, he was correct, not only because of the membranes which are also present in the gleba of *Lycoperdon*, *Calvatia*, *Gastrum*, and in the family Mesophelliaceae, but also because, as he later established (Zeller, 1949), the genera of the Mesophelliaceae have three layers in the exoperidium and *Morganella* has only two. Kreisel (1967) accepted the fact that *Morganella* falls within the Lycoperdaceae in spite of its lack of capillitium, and separated it from the Mesophelliaceae because of the presence of three layers of exoperidium in the latter.

## CONSPECTUS OF THE GENUS *MORGANELLA*

### SECTION MORGANELLA

Subgleba not chambered.

Type: *Morganella fuliginea*

Group Fuligineae

Exoperidium spinose or tuberculate, consisting of chains of short cells.

*M. fuliginea*

*M. purpurascens*

Group Samoenses

Exoperidium spinose, consisting of elongated cells with irregular contours.

*M. samoensis*

Group Velutinae

Exoperidium velvety, consisting of elongated hyphae of one or a few cells, club-shaped or irregular in contour.

*M. velutina*

*M. puiggarii*

SECTION SUBINCARNATA

Subgleba chambered.

Type: *Morganella subincarnata*

Group Subincarnatae

Endoperidium pitted or reticulate-areolate.

*M. subincarnata*

*M. compacta*

Group Afrae

Endoperidium smooth.

*M. afra*

*M. stercoraria*

KEY TO THE SPECIES

Subgleba not chambered, solid.

Exoperidium tuberculate.

Endoperidium smooth.....*M. fuliginea*.

Endoperidium pitted.

The tubercles of the exoperidium consisting of  
chains of short cells.....*M. purpurascens*.

The tubercles of the exoperidium consisting of chains of  
elongated and irregular contoured cells.....*M. samoensis*.

Exoperidium velvety.

Exoperidium of elongated setose cells.....*M. velutina*.

Exoperidium of chains of short, quadrate cells.....*M. puiggarii*.

Subgleba chambered.

Endoperidium pitted.

Exoperidium of short, subpyramidal spines.....*M. subincarnata*.

Exoperidium of elongated, acicular spines.....*M. compacta*.

Endoperidium smooth.

Exoperidium granular.....*M. afra*.

Exoperidium spinose.....*M. stercoraria*.

**Morganella afra** Kreisel & Dring, Feddes Rep. 74: 116. 1967.

Fructifications 1 cm. diameter, depressed-globose to pyriforme; mycelium white, fibrous; exoperidium fuscous above, lighter below, minutely granular; endoperidium light brown, thin, smooth to very minutely aerolate; gleba light brown, becoming greyish as the spores are shed; pseudocolumella and glebal membranes inconspicuous; subgleba light brown, chambered, the chambers sometimes very small and few, or even absent; mouth irregular; paracapillitium hyaline, septate, rarely branched, encrusted,  $3.5\text{--}6.5\ \mu$  diameter; spores light yellowish, globose,  $3.5\text{--}4.5\ \mu$  diameter, minutely asperulate, with a short pedicel.

*Type*.—Dixon 4, Yinahin, Ashanti, Ghana.

*Habitat*.—On decayed wood.

*Distribution*.—Tropical Africa.

*Discussion*.—Kreisel & Dring (1967) said: "This species is quite close to *M. subincarnata* but is distinguished by the smooth or almost smooth endoperidium and the poorly developed glebal membranes and pseudocolumella."

*Material observed*.—I have not seen any material of this species, but by the description of the authors, it looks like an African representative of the section *Subincarnata*.

**Morganella compacta** (Cunningham) Kreisel & Dring, Feddes Rep. 74: 116. 1967. *Lycoperdon compactum* Cunningham, Trans. New Zeal. Inst. 57: 195. 1926.

Fructifications 3–4 cm. diameter, subglobose or pyriforme, depressed above, compressed below into a short stem-like base; exoperidium of strong brown spines, 3–4 mm. long, separate at the base, connivent at the apices, surrounded by a ring



FIG. 1. *M. compacta* (Cunningham) Kreisel & Dring. Atkinson s.n. (H.P.D.D.N.Z. 1102) York Bay, New Zealand. Type of *Lycoperdon compactum* Cunningham (BPI).  $\times 2$ .



FIG. 2. *M. fuliginea* (Berkeley & Curtis) Kreisel & Dring. Wright 705 Valparaiso, Cuba. Type of *Lycoperdon fuligineum* Berkeley & Curtis (FH).  $\times 2$ .

of minute brown warts or granules, the spines partly disappearing with age; endoperidium reticulated, the reticules bordered by the granules of the exoperidium, membranous, ochraceous, becoming brown; mouth plane, torn; gleba olivaceous; pseudo-columella small, elliptical; subgleba ochraceous, minutely cellular, often rudimentary; paracapillitium hyaline, sparsely branched or simple, septate; spores globose,  $3.4\text{--}4.5\ \mu$  diameter, apedicellate, olivaceous, finely and moderately verrucose.

*Type*.—Atkinson s.n. York Bay, New Zealand.

*Habitat*.—On decaying wood.

*Distribution*.—New Zealand.

*Discussion*.—This species differs from the others in the genus by the pronouncedly areolate surface of the endoperidium and the large exoperidial spines.

*Material observed*.—NEW ZEALAND. York Bay, Atkinson s.n. (ex Herb. Pl. Dis. Div. N. Zeal. 10140) Type (BPI); Cunningham s.n. (ex Herb. Pl. Dis. Div. N. Zeal. 1102) (BPI).

***Morganella fuliginea*** (Berkeley & Curtis) Kreisel & Dring, Feddes Rep. 74 (2): 113. 1967. *Lycoperdon fuligineum* Berkeley & Curtis, Journ. Linn. Soc. Bot. 10: 345. 1868. *L. epixylon* Berkeley & Curtis, Journ. Linn. Soc. Bot. 10: 345. 1868. *L. astrocaryi* Berkeley & Cooke in Cooke, Journ. Linn. Soc. Bot. 15: 393. 1873. *L. cubense* Berkeley in Masee, Journ. Roy. Microsc. Soc. 1887: 722. 1887. *L. confluens* Patouillard, Bull. Soc. Myc. Fr. 15: 205. 1899. *Bovista asterospora* Masee, Grevillea 17: 60. 1899. *Morganella mexicana* Zeller, Mycologia 40: 650. 1948.



Fructifications 1–3 cm. diameter, depressed-globose, sessile, seated on a white cord-like mycelium; exoperidium brown, lighter below, covered by minute conical tubercles or spines consisting of clusters of hyphae composed of chains of more or less isodiametric cells, often with lateral outgrowth reminiscent of a clump connection; endoperidium smooth, cinnamon-buff; mouth small, torn; gleba brown at maturity, membranes present; subgleba tan, compact; pseudo-columella not well developed; paracapillitium branched, smooth, hyaline, septate, 3–4  $\mu$  diameter; spores globose, yellowish, echinulate, 3–4  $\mu$  diameter, with spines of about 1  $\mu$  long.

*Type*.—Wright 705, Valparaíso, Cuba.

*Habitat*.—On decaying wood.

*Distribution*.—Mexico, West Indies, Central America, Venezuela, Brazil, Bolivia, West Africa (Dring, 1964).

*Discussion*.—This species, as Kreisel (1967) stated, includes the type of the genus, *Morganella mexicana* Zeller. It differs from *M. velutina* in its exoperidium composed of pluricellular hyphae; that of *M. velutina* is composed of club-shaped setae.

*Material observed*.—CUBA. Wright 506 (705) Type (FH); El Retiro, Wright 881 (FH); Wright 508 (249) (type of *L. epixylon*) (FH); Wright 1053 (as *L. cubense*) (BPI); Wright s.n. (Lloyd 58724) (as *L. epixylon*) (BPI). BRITISH WEST INDIES. GRENADA: Thaxter 3259 (FH). GUADALUPE. Gourbevre 91 (ex Hb. Patouillar 1664) (FH); Dum 912 (ex Hb. Patouillar 1664) (as *L. confluens*) (FH); Dum 515 (ex Hb. Patouillar 1664) (FH); Juss 1089 (ex Hb. Patouillar) (FH). PUERTO RICO. Sierra de Naguabo, Britton 3125 (NY); Utuado, Earle 293 (NY); Martínez Peco & Frontera s.n. (BPI); Martínez Peco s.n. (BPI); Aibonito, Fink 1731 (as *Lycoperdon* ind. (BPI). COSTA RICA. Palmar, Martin & Welden 8277 (as *L. subincarnatum*) (NY); HEREDIA: Gómez 3107, 3108, 3108a, (as *M. velutina*) (F); no location cited: Gómez 3135, (similar to 3086 and 3099) (F). MEXICO. SONORA: Macbride s.n. (type of *M. mexicana*) (ex Myc. Hb. of Iowa) (NY). PANAMA. Barro Colorado, Martin & Welden 7329 (as *L. subincarnata*) (FH); Martin & Welden 7923 (as *L. subincarnatum*) (NY). BRAZIL. Sao Leopoldo: Rick s.n. (FH); Bresadola 3 (ex Hb. Patouillar 1649) (as *L. globaria*) (FH); Theissen s.n. (1906) (as *L. velutinum*) (FH); Theissen s.n. (1905) (as *L. velutinum*) (FH), Theissen s.n. (as *L. velutinum*) (FH), Theissen s.n. (1907) (as *L. velutinum*), Rio Grande do Sul: Parecy Novo, Rick s.n. (1923) (as *L. velutinum*) (FH); Rick 51 (1928) (as *L. velutinus*) (FH), Rick s.n. (1928) (as *L. velutinus*) (FH); Santa Cruz, Rick s.n. (1927) (as *L. velutinum*) (FH); Santa Maria, Rick s.n. (1935) (as *L. velutinum* var. *purpurea*) (FH); Nova Petropolis, Rick s.n. (1923) (as *L. velutinum*) (FH); Rick 129



FIG. 3. *M. puiggarii* (Spegazzini) Kreisel & Dring. Type of *Bovista puiggarii* Spegazzini (LSP).  $\times 3$ .

(Lloyd 24666) (BPI); *Torrend 158* (Lloyd 30570) (BPI); *Torrend 196* (Lloyd 30071) (BPI); *Rick 5413* (Lloyd 30572) (BPI); *Rick 4019* (Lloyd 22891) (as *L. epixylon*) (BPI); *Rick s.n.* (ex Mus. Paris) (Lloyd 22892) (BPI). VENEZUELA. Orinoque: *Gaillard s.n.* (ex Hb. Patouillar 1664) (FH). TRINIDAD. Cedros, *Watafiels s.n.* (NY). BOLIVIA. Vaca Diez, Guayaramerim, *Singer B2096*, *B2029* (ex Fund. M. Lillo) (F); Nor-Vungus, Rio Yariza, *Singer B1413* (ex Fund. M. Lillo) (F). PERU. Dpto. Loreto, Island in Amazon River opposite Iquitos. *Simpson F77* (F). UNITED STATES. GEORGIA: *Bartlett 1575* (FH) (BPI). FLORIDA: *Dunne 3* (Lloyd 122893) (BPI). AFRICA. No location cited: *Uscher s.n.* (Lloyd 30569) (BPI). HUNGARY: *Hollos s.n.* (ex Hb. Hollos) (FH). CHINA. HAINAN: *Deng 7204* (BPI); *Deng 5752* (BPI-4321) (BPI).

***Morganella puiggarii*** (Spegazzini) Kreisel & Dring, Feddes Rep. 74: 116. 1967. *Bovista puiggarii* Spegazzini, Bol. Acad. Nac. Cienc. Córdoba 11: 470. 1887. *Radiigera puiggarii* (Spegazzini) Singer, Wright & Horak, Darwiniana 12: 603, 1963.

Fructifications 10–15 mm. diameter, pear-shaped or globose to obovate; mycelium rhizoid-like, white; exoperidium pallid-whitish when fresh (according to Spegazzini), blackish-brown when dried, surface velutinous or somewhat tomentose; endoperidium white or pallid-whitish, not separating from the exoperidium or from the gleba; mouth not seen; gleba grayish-olive (according to Spegazzini) when fresh, milk-coffee-colored when dried, pulverulent, tramal plates radial, anastomosing; columella with a convex upper part; subgleba small, compact, of

filamentous, thick-walled elements; spores 3.4–4  $\mu$  diameter, globose, brown; paracapillitium irregular, septate, not or rarely branched, hyaline (cyanophilous), 3.5–4  $\mu$  diameter.

*Type*.—Apiá (Apiáhy), leg. Puiggari, São Paulo, Brazil (LPS).

*Habitat*.—Gregarious on rotting fallen trunks in forest.

*Distribution*.—Brazil, Paraguay.

*Discussion*.—This species' principal character is the trichodermal palisade of elements in chains that integrate its exoperidium. The swollen terminal cells separate it from *M. fuliginea*.

This species has been considered as belonging in the genus *Radiigera*, subgenus *Endoplectidium* by Singer et al. (1963), but the lack of capillitium, and the exoperidium of two layers, place it in *Morganella*. It differs from *Bovista*, where Spegazzini put it, by the lack of capillitium.

*Material observed*.—BRAZIL. SAO PAULO: Apiá, Puiggari s.n. Type (LSP). PARAGUAY. Anisits 369 (as *Bovista puiggarii*) (LSP).

***Morganella purpurascens*** (Berkeley & Curtis) Kreisel & Dring, Feddes Rep. 74: 115. 1967. *Lycoperdon purpurascens* Berkeley & Curtis, Proc. Amer. Acad. Arts Sci. 4: 124. 1860. *Bovista purpuracea* (Berkeley & Curtis) De Toni in Saccardo, Syll. Fung. 7: 97. 1888, sphalm. *Lycoperdon tephrum* Berkeley ex Masse Journ. Roy. Microsc. Soc. 1887: 723. 1887. *L. lignigenum* P. Hennings & E. Nyman in Warburg, Monsunia 1: 23. 1900. *L. subincarnatum*



FIG. 4. *M. purpurascens* (Berkeley & Curtis) Kreisel & Dring. Wright (U.S.N. Pacific Exp. Expd. no. 118). Bonin Island. Type of *Lycoperdon purpurascens* Berkeley & Curtis (FH).



Peck *sensu* Cunningham, Gaster. Australia & New Zealand 147. 1944.

Fructifications 2–3 cm. diameter, subglobose, sessile; exoperidium brown, lighter below, covered with minute, conical tubercles consisting of chains of roughly globose cells which often collapse; endoperidium papyraceous, pitted like a thimble, light brown; mouth small, torn; gleba olivaceous; subgleba obsolete; pseudocolumella large but inconspicuous; paracapillitium flaccid, branched, hyaline; glebal membranes inconspicuous; spores 3.5–4  $\mu$  diameter, almost smooth to minutely spiny, with an oil drop inside, pedicel hyaline, collapsed.

*Type*.—Wright, U.S.N. Pacific Expl. Exped. 1853. Bonin Is. (K) (FH).

*Habitat*.—On decaying wood.

*Distribution*.—Australia, Pacific Islands, Philippines, India.

*Discussion*.—This species is confined to Australia, India, and the Pacific Islands. The pitted endoperidium and the almost smooth spores are the principal characteristics of this species.

*Material observed*.—BONIN ISLAND. Wright (U.S.N. Pacific Expl. Exped. No. 118) Type ex Hb. Gray (FH). NEW CALEDONIA. *LeRat* 117 (as *L. mixtum*) (Patouillard 1696) (FH). INDIA. Ceylon: *Petch* 2983 (Lloyd 37967); *Petch s.n.* (Lloyd 51760) (BPI). PACIFIC ISLANDS. *Petch s.n.* (Lloyd 37957) (BPI). PHILIPPINES. LUZON: *Reinking* 9990 (Lloyd 30560) (BPI); Basilan Isl., Isabela, *Yates s.n.* (Lloyd 41527) (BPI). AUSTRALIA. *Cheel s.n.* (Lloyd 30561) (BPI). SAMOA. *Lloyd* 5039 (30563) (BPI); *Lloyd* 5039 (Lloyd 30562) (BPI); *Lloyd* 5 (5039) (Lloyd 30564) (BPI).

***Morganella samoensis*** (Bresadola & Patouillard) P. Ponce, *comb. nov.* *Globaria samoensis* Bresadola & Patouillard, in Lloyd Myc. Writ. 1: 50. 1901. *Lycoperdon samoense* (Bresadola & Patouillard) Saccardo, Syll. Fungorum 17: 233. 1902.

Fructifications 3–5 cm. diameter, sessile or subsessile, obovoid or utriform; mycelium white; exoperidium furfuraceous, brown, with minute conical tubercles consisting of elongated irregular cells which later collapse; endoperidium papyraceous, reticulated, light brown; mouth lacerate, dehiscing irregularly; gleba olivaceous to dark brown; subgleba obsolete; paracapillitium flaccid, the threads often fused, subhyaline, 3–5  $\mu$  diameter; glebal membranes present; spores globose, smooth, tawny with a yellowish center, 3–3.5  $\mu$  diameter.

*Type*.—Lloyd 5056 (Lloyd Cat. 30584) *Lycoperdon samoense* n.s. (BPI).

*Habitat*.—On wood.



FIG. 5. *M. samoensis* (Bresadola & Patouillard) P. Ponce. Type of *Globaria samoensis* Bresadola & Patouillard (BPI).  $\times 1$ .

*Distribution*.—Samoa.

*Discussion*.—This species is very close to *Morganella purpurascens*, from which it differs by its large size, elongated cells of the exoperidium, and its smooth spores.

*Material observed*.—SAMOA. UPOLU ISLAND: *Lloyd 5056*. Type of *Globaria samoense* (BPI). *Lloyd 5016* as *Lycoperdon samoense* Bresadola & Patouillard ex Herb. Patouillard. Part of the type collection? (FH).

### *Morganella stercoraria* P. Ponce, sp. nov.

Fructificationes 1–1.5 cm. diam., globosae vel pyriformes, sessiles; mycelium album, filiforme; exoperidium spadiceum vel pallido-fuscum, spinae breves, apices conniventes; endoperidium firmum, laeve; gleba lutea et leviter cinereascens; subgleba albido-lutea, parva, cellulosa (cellulae irregulares); pseudocolumella inconspicua; paracapillitium 3–3.4  $\mu$  diam., pallido-luteum, laevis vel leviter rugosum, aliquot minute pedicellatum.

Fructifications 1–1.5  $\mu$  diameter, globose or short-pyriforme, sessile; mycelium white, thread-like; exoperidium tan to light-brown, composed of small pluricellular spines connivent at the apices, sometimes persisting at maturity; endoperidium firm, smooth; mouth irregular; gleba yellowish, with a gray shadow; subgleba whitish-yellow, small, with large and irregular chambers; pseudocolumella inconspicuous; paracapillitium rarely branched, irregular, hyaline, septate, 3–4  $\mu$  diameter; spores globose, 3–3.4  $\mu$  diameter, smooth to moderately rugose, with a very thick wall, some with a minute pedicel.

*Habitat*.—On cow dung.

*Type*.—*Fink 740*, El Yunque, Puerto Rico (*Lloyd 43945*) (BPI).

*Distribution*.—Puerto Rico.

*Discussion*.—This species belongs in the section *Subincarnata*, and is separated from *M. subincarnata* by its spores (those of the latter being spinose), the lighter color of the exoperidium, and the smooth endoperidium. It is distinguished from *M. afra* by the larger spines of the exoperidium, smoother spores, and larger chambers of the subgleba.

This collection, *Fink 740*, has been cited (Stevenson, 1936) as the probable basic material of *Lycoperdon fimicola* Lloyd. However, this is a *nomen nudum*, as there is no description of the material by Lloyd.

***Morganella subincarnata*** (Peck) Kreisel & Dring, Feddes Rep. 74. 117. 1967. *Lycoperdon subincarnatum* Peck, Ann. Rep. New York State Mus. Nat. Hist., Bot. 24: 83. 1872.

Fructifications cespitose, 2–4.5 cm. diameter, depressed-globose, or short pyriform, sessile, some with a broad point of attachment on a white fibrous mycelium; exoperidium brown to reddish-brown, composed of small, separate, subpyramidal tubercles or spines with their tips connivent, consisting of chains of cells, which fall at maturity; endoperidium firm, tough, pitted like a thimble; mouth 3–4 mm. diameter; gleba white at first, becoming yellowish and finally olive umber, with obviously radiating membranes, subgleba chambered, white to light brownish, occupying one-third of the total fructification, pseudocolumella distinct; paracapillitium rarely branched, hyaline, septate, 3.5–6.5  $\mu$  in diameter; spores 4–5  $\mu$  in diameter, light yellowish-brown, globose-echinulate, with a minute pedicel.

*Type*.—Peck 2959, Sandlake, New York (NY).

*Habitat*.—On decaying wood.

*Distribution*.—North America.

*Discussion*.—This species is easily distinguished by the small pits outlined by acute ridges on the endoperidium, that make its surface

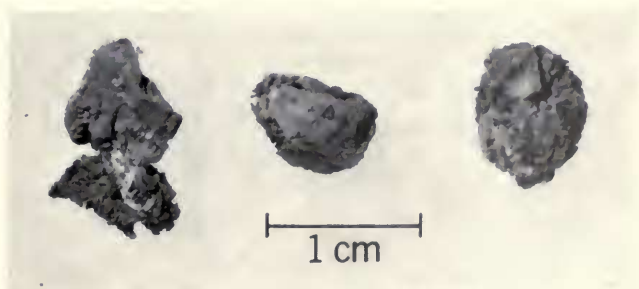


FIG. 6. *M. stercoraria* P. Ponce. *Fink 740* El Yunque, Puerto Rico. Type. (Lloyd Cat. 43945) (BPI).



FIG. 7. *M. subincarnata* (Peck) Kreisel & Dring. Peck 2959 Sandlake, New York. Type of *Lycoperdon subincarnatum* Peck. (NY).  $\times 2$ .

appear like a thimble under the lens. It is separated from *M. compacta* by the large spines of the exoperidium of this species.

*Material observed*.—UNITED STATES. NEW YORK: Sandlake, Peck 2959 Type (NY). Peck 10 annotated by C.T. Rogerson as probably part of the type (NY); Cazenovia, Morgan s.n. (NY); Adirondacks, Lake Placid, Murrill 543 (NY); Adirondacks, Camp Kanasa, Murrill 74 (NY); Delaware Co., Arkville, Murrill s.n. segregated "A" by D.M. Dring (NY); Burnham s.n. (Lloyd 7039) (BPI); Lodenick s.n. (Lloyd 16465) (BPI); Clute s.n. (Lloyd 31353) (BPI); Schum s.n. (Lloyd 31557) (BPI); Long 1833 (Lloyd 31558) (BPI); Hb. of NYBG s.n. (Lloyd 31559) (BPI); Peck 8 (Lloyd 31560) (BPI); Darker s.n. (FH). MAINE: Bar Harbor, White s.n. (NY). VERMONT: Sudbury, Wright s.n. (ex Hb. Bart.) (FH); Hadley 17 (Lloyd 31544) (BPI). MASSACHUSETTS: Page 9 (Lloyd 31547) (BPI). NEW HAMPSHIRE: Jones s.n. (Lloyd 31555) (BPI); Theobald s.n. (Lloyd 31556) (BPI). NEW JERSEY: Paddock s.n. (NY). PENNSYLVANIA: Buck Hill Falls, Delafield s.n. four collections (NY); Bilgram s.n. (Lloyd 31548–31552) (BPI); OHIO: Preston, Monroe Co., Stifler s.n. (1931, 1934) (F) (NY); Morgan s.n. (NY); Smith 96 (Lloyd Hb. 8671) (NY) (BPI); Smith s.n. (Lloyd Hb. 7329) (Lloyd 31534) (BPI). MICHIGAN: Bessey s.n. (Lloyd 16462), (Lloyd 16464) (BPI); Upper Tahquamenon Falls, Luce Co. Alexia s.n. (MICH.) INDIANA: Bichtel s.n. (Lloyd 14827) (BPI). WASHINGTON D.C.: Braendle s.n. (Lloyd 31545) (BPI). VIRGINIA: Schum s.n. (Lloyd 31537) (BPI); Boutlou 54 (Lloyd 31538) (BPI); Lloyd 5691 (Lloyd 31539) (BPI). WEST



FIG. 8. *M. velutina* (Berkeley ms. ex Massee) Kreisel & Dring. *Fendler s.n.* Venezuela. Type of *Lycopodon velutinum* Berkeley & Massee (NY).  $\times 2$ .



VIRGINIA: *Lloyd 5691* (Lloyd 31540); *Lloyd 2606* (Lloyd 31541); *Lloyd 2619* (Lloyd 31542) (BPI). NORTH CAROLINA: *Coker 8870* (ex Hb. U. of N.C.) (FH); Winston-Salem, *Schallert 2304* (F). FLORIDA: *Singer F 237* (Fungi Floridani) (FH); *Thaxter 3442* (FH). CANADA. ONTARIO: *Cain 7438* (as *L. timagani*) (NY); *Fowler s.n.* (Lloyd 31543) (BPI); Harraly, Lake Rosseau, *Harper s.n.* (Field Mus. 1286998) (F). No location cited: *Patouillard 5662* (FH).

***Morganella velutina*** (Berkeley ex Massee) Kreisel & Dring, Feddes Rep. 74: 114. 1967. *Lycoperdon velutinum* Berkeley ex Massee, Journ. Roy. Microsc. Soc. 1887: 718. 1887.

Fructifications 3 cm. diameter, depressed-globose to pulvinate, usually with a marked umbo, sessile on a white cord-like mycelium; exoperidium mahogany color shading to tan below, darker when dry, persistent, densely velutinous, consisting of setose hyphae mostly 100  $\mu$  long and clavate; endoperidium smooth, very thin; mouth small and torn; gleba umber, membranes not prominent, pseudocolumella small and flattened, not well marked; subgleba tan, compact; paracapillitium branched, smooth, hyaline, cyanophilus, septate, 3–4  $\mu$  diameter; spores globose, 3.5–4  $\mu$  diameter excluding ornament, spines up to 1  $\mu$  long, often with flattened tips.

*Type*.—*Fendler 235* and *236*, Colonia Tovar, Venezuela (K).

*Habitat*.—On decaying wood.

*Distribution*.—Eastern North America: Florida, North Carolina, New Jersey. South America: Venezuela, Brazil.

*Discussion*.—This species may be separated from related species in the genus by its setose exoperidium of clavate hyphae.

*Material observed*.—UNITED STATES. NEW JERSEY: Newfield, *Ellis 5013* (as paratype of *M. mexicana*) (NY). FLORIDA: Alachua Co., *E. West s.n.* (as *L. subincarnatum*) (NY). VENEZUELA. *Ellis* (ex Hb. Fendler) (NY); *Massee s.n.* (NY); *Hennings s.n.* (Lloyd 22897) (BPI); *Hennings s.n.* ex type Kew (Lloyd 50776) (BPI). AMAZONAS: Cano Tucano, Río Cauaburi, *Maguire & Steyermark 60243* (NY) (F); Cerro de la Neblina, *Maguire, Wurdack and Bunting 36907* (NY) (F). BRAZIL. No location cited, *Rick s.n.* (Lloyd 22894), (Lloyd 22895) (BPI); *Pazschke s.n.* (Lloyd 22896) (BPI); *Rick 52* (Lloyd 25311) (BPI). RIO GRANDE DO SUL: Nova Petropolis, *Rick s.n.* (FH). TRINIDAD. Santa Cruz, *Broadway 7037* (F).

#### SPECIES DUBIAE

There are two species of *Lycoperdon*, *L. brasiliense* Fries and *L. pisiforme* Hennings, which in the opinion of several authors can be placed in *Morganella*.

*Lycoperdon brasiliense* Fries, Syst. Myc. 3: 40, 1829.

For this species we have only the description of Fries, as the type cannot be located. He said,

"*L. brasiliense*, peridio membranaceo persistente globoso punctato-scabro, ore obtuso, floccis laxis, sporidiis fuliginosis . . .

Peridio membranaceo floccido, extus tantus punctato-scabro, ut Lycogala, cui exoleto simile est . . .

*Ad truncos Brasiliae.* Beyrich!"

The type was collected by Beyrich in Brazil, but his specimens have not been found in any of the herbaria to which he sent his collections.

*Lycoperdon pisiforme* Hennings, Bot. Jahrb. 23: 556. 1897.

Dring (1964) and Kreisel (1967) have suggested that this species might be placed in *Morganella*, mostly because of its small size, its habit of growing from a subiculum on dead wood, and its hyaline capillitium. However, the spores from the type of this species in the Lloyd collection have a different episporium, which is thicker than that of *Morganella*, and its sculptures are not spines or warts, but elongated ridges as in the spores of *Lycogalopsis*.

Because of the characteristics observed in the episporium, the shining peridium, and the extensive white shining subiculum mentioned in the description, it is assumed that this species may belong in the genus *Lycogalopsis* Fischer.

#### SPECIES EXCLUSA

Restudy of the type of *Lycoperdon albidum* Cooke (*Morganella albida* P. Ponce) and comparison with the type of *Lycogalopsis solmsii* Fischer shows these two to be identical in their clamp connections, in the disposition of the basidia in groups, the short sterigmata of the spores, and the constitution of the peridia. It is necessary, therefore, to place the first two names in synonymy under *Lycogalopsis solmsii* Fischer, as indicated by Dennis (1953) and as suggested by Dring in a personal letter to me in April, 1970.

#### LIST OF ACCEPTED NAMES AND SYNONYMS

Accepted Names in **bold face**

Synonyms in *italics*

**afra** Kreisel & Dring . . . . . **Morganella**  
**albina** (Cooke) P. Ponce (*Morganella*) . . . . . *Lycogalopsis solmsii*

- asterospora* Mass. (Bovista) . . . . . *Morganella fuliginea*  
*astrocaryi* Berk. & Cke. (Lycoperdon) . . . . . *Morganella fuliginea*  
*compacta* (Cumm.) Kreisel & Dring . . . . . *Morganella*  
*compactum* Cumm. (Lycoperdon) . . . . . *Morganella compacta*  
*confluens* Pat. (Lycoperdon) . . . . . *Morganella fuliginea*  
*cubensis* Berk. (Lycoperdon) . . . . . *Morganella fuliginea*  
*epixylon* Berk. & Curt. (Lycoperdon) . . . . . *Morganella fuliginea*  
*fuliginea* (Berk. & Curt.) Kreisel & Dring . . . . . *Morganella*  
*fuligineum* Berk. & Curt. (Lycoperdon) . . . . . *Morganella fuliginea*  
*fuligineum* Berk. & Curt. *sensu* Dring (Lycoperdon) . . . . . *Morganella afra*  
*golungense* Welw. & Curr. (Lycoperdon) . . . . . *Geastrum* sp.  
*golungense* Welw. & Curr. *sensu* Beeli. (Lycoperdon) . . . . . *Geastrum* sp.  
*mexicana* Zeller (*Morganella*) . . . . . *Morganella fuliginea*  
*puiggarii* (Speg.) Kreisel & Dring . . . . . *Morganella*  
*puiggarii* Speg. (Bovista) . . . . . *Morganella puiggarii*  
*puiggarii* (Speg.) Singer, Wright, & Horak (*Radiigera*) . . . . . *Morganella puiggarii*  
*purpurascens* (Berk. & Curt.) Kreisel & Dring . . . . . *Morganella*  
*purpurascens* Berk. & Curt. (Lycoperdon) . . . . . *Morganella purpurascens*  
*purpurascens* (Berk. & Curt.) De Toni (Bovista) . . . . . *Morganella purpurascens*  
*pyriforme* Pers. var. *tesselatum* Pers.  
*sensu* Dissing & Lange (Lycoperdon) . . . . . *Morganella afra*  
*samoensis* (Bres. & Pat.) P. Ponce . . . . . *Morganella*  
*samoensis* Bres. & Pat. (*Globaria*) . . . . . *Morganella samoensis*  
*samoense* (Bres. & Pat.) Saccardo (Lycoperdon) . . . . . *Morganella samoensis*  
*stercoraria* P. Ponce . . . . . *Morganella*  
*subincarnata* (Peck) Kreisel & Dring . . . . . *Morganella*  
*subincarnatum* Peck *sensu* Cunn. (Lycoperdon) . . . . . *Morganella purpurascens*  
*subincarnatum* Peck (Lycoperdon) . . . . . *Morganella subincarnata*  
*tephrum* Berk. ex Mass. (Lycoperdon) . . . . . *Morganella purpurascens*  
*velutina* (Berk. & Curt.) Kreisel & Dring . . . . . *Morganella*  
*velutium* Berk. & Curt. (Lycoperdon) . . . . . *Morganella velutina*

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